regional determinants that might dictate differentiation of progenitor cells towards neuronal fate and particular neurotransmitter phenotype. In the present study we determined intrinsic and extrinsic regional cues in mesencephalic regions and investigated differentiation potential of mouse E12 mesencephalic neurospheres. The results show that neurospheres likely exhibit regional identity in vitro, reflected as differential expression of sonic hedgehog, Nurr1, Pitx3 and TH by RT-PCR. Treatment of ventral neurospheres with TGF-beta, neutrurin, artemin, persephin, but not GDNF, significantly increased number of TH immunoreactive cells, compared to controls. Persephin, artemin, and GDNF in combination with TGF-beta, however, did not increase TGF-beta effects. In addition, neutralization of endogenous TGF-beta in the presence of exogenous persephin, atremin or GDNF significantly reduced number of TH immunopositive cells, compared to untreated cultures. The results support the notion that behavior of neural stem cells is likely conserved between brain compartments. However, different stem cells in ventral and dorsal midbrain express molecular markers of regional identity in vitro. In addition, members of the TGF-beta superfamily promote differentiation of ventral mesencephalic neurospheres towards dopaminergic phenotype in vitro.

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Program/Abstract # 392
Cell autonomous acquisition of DRG sensory neuron fate: An ongoing analysis of Sox10 mutants
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Early neural crest cells express Sox10, a transcription factor required for the maintenance of multipotency and the subsequent establishment of particular pigment, neuronal and glial cell types. Mouse Sox10−/+ mutants display strong haploinsufficient defects in NC derivatives, and in zebrafish the homozygous phenotype *cls* also displays loss of pigment cells, neuronal and glial components. Dorsal root ganglia (DRGs) are neural crest-derived, reiterated cell clusters consisting of sensory neurons (SN) and supporting glia. Sox10 is initially expressed in both glial and neuronal progenitors and is later maintained during glial differentiation. However, additional factors are needed for cells to adopt a particular fate. These could include the Notch/Delta signalling pathway, which influences the choice between neuronal and glial fates in the chick embryo. We have recently described the novel Sox10^{baz1} allele, which shows the characteristic loss of pigment cells (melanophores) and glia but in contrast displays a unique hypermorphic SN phenotype. Sox10^{baz1} also evidences DRG SN survival in zebrafish is not dependent on glial trophic support. We are currently examining cell proliferation, differentiation and programmed cell death in *cls* and Sox10^{baz1} DRGs. This will provide us with a more complete understanding of cell dynamics changes and development regulation in DRGs.

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Program/Abstract # 393
Rohon-Beard sensory neurons are induced by BMP4 expressing non-neural ectoderm in *Xenopus laevis*
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Rohon-Beard (RB) mechanosensory neurons arise at the border of the neural- and non-neural ectoderm during embryonic development in vertebrate anamniotes. Neural crest cells and neurogenic placodes also arise from this region, and neural crest cells require BMP expressing non-neural ectoderm for their induction. To determine if the epidermal ectoderm is also involved in the induction of RBs, the medial region of the neural plate (NP) from donor *Xenopus laevis* embryos was transplanted into the non-neural ventral ectoderm of stage-matched hosts. RBs were induced at the sites where transplants made contact with the non-neural ectoderm, as shown by expression of *XHox11L2* and *XN-tubulin*. Using NP tissue from pigmented donor embryos and albino embryos as hosts, we found that the induced neurons form both in the donor neural and host epidermal tissue. Because an intermediate level of BMP4 signaling in the ectoderm is required to induce NP border fates, we tested its ability to induce RBs. An intermediate level of BMP4 activity induced RBs as demonstrated by culturing medial NP tissue with beads containing 1 or 10 ng/ml hBMP4 protein. When BMP activity is decreased in NP tissue by injection of mRNA encoding *noggin* or a dominant negative BMP receptor into donor embryos, RBs fail to form at transplantation sites, indicating that BMP activity is required for induction of ectopic RBs. We conclude that contact between neural and non-neural ectoderm is capable of inducing RBs and that BMP4 can induce RBs in NP tissue and substitute for epidermal ectoderm.

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Program/Abstract # 394
Specification of cell types in the asymmetric pineal complex of zebrafish
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The existence of anatomical left–right (L–R) differences in the brain and visceral organs is an evolutionarily